UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/343,092	06/30/1999	HIDEO SAMURA	50059-048	7482

20277 7590 05/17/2007
MCDERMOTT WILL & EMERY LLP
600 13TH STREET, N.W.
WASHINGTON, DC 20005-3096

EXAMINER	
NGUYEN, LAM S	
ART UNIT	PAPER NUMBER
2853	
MAIL DATE	DELIVERY MODE
05/17/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/343,092	SAMURA, HIDEO	
	Examiner	Art Unit	
	LAM S. NGUYEN	2853	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 March 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 June 1999* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 12 and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanaya et al. (US 6217158) in view of Chang (US 6099111) and Hasegawa et al. (US 5530465).

Kanaya et al. discloses a head for ink-jet printer comprising:

a substrate in which a plurality of ink nozzles (*FIG. 27(a)-(b): Three bottom layers*) and a plurality of ink passages (*FIG. 27(a)-(b), element 22*) each communicating separately to each of the ink nozzles having tapered configurations are formed (*FIG. 27(a)-(b): The ink exit at the bottom*);

an inorganic substrate which is joined with said substrate and is provided with ink chambers (*FIG. 3, element 23*) each communicating separately to each of the ink passages (*FIG. 27(a)-(b), element 22*); and

a piezoelectric element (*Abstract*) of ferroelectric substance for changing separately a capacity of each of the ink chambers to jet an ink from said ink nozzles through said ink passages, wherein said substrate includes a structure in which a plurality of substrates of equal thickness are laminated *FIG. 27(a)-(b): Three bottom layers of the same material and thickness are laminated to form the substrate*);

wherein said ink passages are fine as compared with said ink chambers and said

ink nozzles are fine as compared with said ink passages (*FIG. 27(a)-(b): The width of the ink passage 22 is narrower than that of the ink chamber 23*);

wherein said in nozzles and said ink passages arc communicated by laminating the substrate in which said ink nozzles are processed (*FIG. 27(a)-(b): The bottom substrate*) and the substrate in which said ink passages are processed (*FIG. 27(a)-(b): The adjacent upper substrates to the bottom substrate*).

- Kanaya et al. however is silent wherein said inorganic substrate has a common ink supply port located between a plurality of said piezoelectric elements for supplying ink to said plurality of ink passages at a portion on a surface of said inorganic substrate, and an ink tank for storing ink supplied to said ink chambers of said printer head.

Chang discloses an ink jet recording head having piezoelectric elements (*FIG. 2, element 11, 12*) acting as pressure generating elements on ink chambers (*FIG. 2, element 3, 4*) to eject ink drops through nozzles having tapered configurations (*FIG. 2, elements 7, 8*), wherein the ink chambers are filled with ink through a common ink supply port from an ink tank for storing ink (*FIG. 2, element 2, 13, 20, 22*), wherein the common ink supply port is located between a plurality of said piezoelectric elements (*FIG. 2, element 11, 12*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify Kanaya et al.'s printhead to include and locate a common ink supply port between a plurality of the piezoelectric elements as disclosed by Chang. The motivation of doing so would have been to prevent crosstalk between ink flow paths as much as possible from occurring thereby allowing the ink droplet ejection characteristics to be stabilized as taught by Chang et al. (*column 2, lines 28-31*).

- Kanaya et al. also does not disclose wherein the substrate is a silicon substrate in which the plurality of ink nozzles and the plurality of ink passages are processed finely using a plasma etching method.

Hasegawa et al. discloses an ink jet head provided with a plurality of nozzles and ink passages arranged/processed in an array of laminated silicon substrates and in communication to each other (*Abstract and column 2, lines 11-14, FIG. 8B, elements 101, 107; column 14, lines 40-55*), wherein the plurality of nozzles and ink passages are formed by a plasma etching method (*column 15, lines 21-30 and column 16, lines 14-30*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify Kanaya et al.'s printhead to form the ink nozzles and the ink passages on the silicon substrate as disclosed by Hasegawa et al. The motivation of doing so is to obtain high nozzle density even when number of nozzles is increased as taught by Hasegawa et al. (*column 4, lines 34-35*).

2. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kanaya et al. (US 6217158) in view of Chang (US 6099111) and Hasegawa et al. (US 5530465), as applied to claim 12, and further in view of Hackleman (US 5414245).

Kanaya et al., as modified, discloses the claimed invention as discussed above except wherein a pitch of the ink nozzles is approximately 20 μm.

Hackleman discloses an ink jet printhead inclduing an array firing ink nozzles having a pitch of the ink nozzles is approximately 20 μm (*Column 4, lines 55-61*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the printhead disclosed by Kanaya et al., as modified, to form

the ink nozzles having the pitch approximately 20 μm as disclosed by Hackleman. The motivation of doing so would have been to obtain a standard printing technology applications (1200 ink jet dots per inch) as taught by Hackleman (*column 4, lines 55-61*).

Response to Arguments

Applicant's arguments with respect to claim 12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S. NGUYEN whose telephone number is (571)272-2151. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D. MEIER can be reached on (571)272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LAM SON NGUYEN